Fiscal Shocks and Automatic Stabilizers at Work in European Countries

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Abstract
The paper extends the Blanchard-Perotti (2002) methodology of structural identification for VARs in order to capture and to compare the dynamic effects of (discretionary) fiscal shocks and the operation of automatic stabilizers in eight European countries from 1975 to 2004. We analyse the dynamic effects of three distinct fiscal policy tools: primary public spendings, public transfers paid by government and total direct, indirect and social taxes. Results show a very small effect of discretionary shock -except for shocks on transfers. They also confirm the destabilizing effect of primary spending shock in small countries.

Automatic stabilizers work when they are based on taxes that do not react strongly to output fluctuations. On the contrary, as transfers are supposed to be proportional to employment they are very sensitive to output and can become destabilising.

Key Words: Fiscal Policy, Automatic Stabilizers, SVAR, Composition effects

JEL Codes: C22; E62; E63

1 Introduction
We investigate a twofold matter of concern as regard dynamic effects of fiscal policy on short-run output. First, we wonder whether automatic stabilisers work fully or not, i.e. if significant changes in fiscal sensitivity to economic fluctuations are associated with significant changes in GDP volatility or with significant changes in the persistence of the GDP response to exogenous shocks. Second, it is wondered how large and durable are dynamic effects of discretionary fiscal shocks. In theory, those questions are very complementary inasmuch as beyond the scope of fiscal policy
optimality, a growing literature exposes the need for fiscal rules. Such rules are tremendously based on the belief in the inconsistency of discretionary actions in a world of expectation-driven shocks. Nevertheless, fiscal systems and tax codes that hold various degrees of progressiveness can be used as an effective (even or not desirable) macro-stabilisation tool (Solow, 2002). Conversely, recent research seems to renew the interest of "supply side" fiscal reforms (Lucas, 2003). It is argued that "fiscal rules" should consist in lowering the size of the public sector thanks to spending and tax cuts. The best way to increase macroeconomic stability should be to reduce the tax burden and its distortional effects.

This paper aims to provide some empirical evidence on both multiplier effects and automatic stabiliser effects of fiscal policy involved in this debate. To that end, we use the Blanchard-Perroti (2002) structural VARs approach for eight European countries. These method allows for output elasticities of fiscal variables to act as identification constraints of structural policy shocks: actually "discretionary" shocks are computed as innovations of fiscal variables corrected from their cyclical dependence. Fiscal multipliers are simply computed from the impulse response of output to a structural fiscal shocks. We develop this approach in two complementary ways. First, the cyclical dependence of fiscal revenues and spendings also creates an "automatic stabilisation" effect as exogeneus shock on output will shift the tax receipts and the amount of public spending. It is possible to compute the degree of macro stabilisation as a ratio between the accumulated response of fiscal variables to the accumulated response of output. Second, we distinguish the fiscal variables that carry automatic stabilisation (like taxes and transfers) from others (primary expenditures). Those extensions allow for measuring, in the same framework, fiscal multipliers and automatic stabilizers and for taking into account some composition effects that might invalidate policy prescription based on aggregate fiscal variables.

The study focuses on European countries for which the data set covers a long enough period. In these countries the use of fiscal policy is still a subject of discussion. The difficult implementation of the Stability and Growth Pact -in Germany, Italy, France, Portugal and also in Ireland- leads to policy reforms. France and Italy have announced reduction of taxes and whish to reduce public spendings. Even if we shall not discuss the impact of such policies directly in term of public finance sustainability, we are focusing on their macro-stabilisation impact. More generally, we shall discuss the factors that can facilitate the operation of automatic stabilisers and those which let effective more activist policies.

Next section is devoted to the presentation of the Blanchard-Perroti model and the structural Vars we estimate. Section 3 deals with the results of empirical simulation of fiscal multipliers and automatic stabilizers. The last Section concludes.
2 Modelling Fiscal Policy Effects

The construction of quarterly fiscal dataset has recently permitted to apply time series econometrics for dealing with empirical analysis of fiscal policy determinants and outcomes. These applied research papers discuss different methods of identification for Structural Vectorial AutoRegressive (SVAR) model. In particular, we pay attention to the Blanchard and Perotti (2002) model because its identification is not depending on a priori hypotheses about fiscal policy effects but on short-run output elasticities of endogenous fiscal variables. This cyclical dependence is different from one country to another and is due to both macroeconomic characteristics (output elasticity of private consumption, employment) and political choice (national tax codes might provide different wage elasticity of tax revenues). We begin with a presentation of the standard Blanchard-Perotti model, then we explicit the data used in this paper and the specific modelisation we estimate.

2.1 The Blanchard and Perotti (2002) Model

VAR models explain the dynamic of various endogeneous variable by a structure of significant lags.

\[ \Phi(L)X_t = u_t \]

\( X_t \) is a \((3 \times 1)\) vector of endogenous variables. It is composed by: \( T \) the total tax revenue; \( G \) public spending and \( Y \) the GDP. All this variables are expressed in real term per capita and in first log difference. \( \Phi(L) \) is a lagged polynomial function, the number of lags is computed using standard information criteria. The vector of canonic residuals \( u_t \) collects innovations of endogenous variables.

\[ u_t = \begin{pmatrix} t_t & g_t & y_t \end{pmatrix}' \]

These innovations represent combinations of three structural shocks: a structural shock on tax pressure \( \varepsilon^T_t \), a structural shock on government spending \( \varepsilon^G_t \) and a structural shock on economic activity \( \varepsilon^Y_t \). The vector of structural shocks is noted \( \varepsilon_t \):

\[ \varepsilon_t = \begin{pmatrix} \varepsilon^T_t & \varepsilon^G_t & \varepsilon^Y_t \end{pmatrix}' \]

The transformation of canonic residuals into structural shocks is given by the following system:

\[
\begin{align*}
  t_t &= \alpha_{1.3}y_t + \beta_{1.2}\varepsilon^T_t + \varepsilon^T_t \\
  g_t &= \alpha_{2.3}y_t + \beta_{2.1}\varepsilon^T_t + \varepsilon^G_t \\
  y_t &= \alpha_{3.1}t_t + \alpha_{3.2}g_t + \varepsilon^Y_t
\end{align*}
\]

(1)

Contrary to standard Blanchard-Quah identification, this transformation allows for fiscal variables to affect the output within the quarter, as well as it allows for output innovations to move fiscal variables within the quarter. These dependancies
reflect the automatic cyclical dependance of fiscal variables as well as the mechanic (immediate) response of activity.

The first equation of the system regards innovation in tax pressure as cyclically related to activity (with an elasticity of $\alpha_{1,3}$). The cyclically adjusted innovation of tax pressure ($t_t - \alpha_{1,3} y_t$) is then broken up into a discretionnary response to shocks on public spending (with a factor of reaction of $\beta_{1,2}$) and a discretionnary (exogeneus) shock in tax pressure. The second equation presents the same decomposition for innovation in government spending that is assumed to be related to output (with an elasticity of $\alpha_{2,3}$) and then, to be seen as a combinaison of a response to tax shocks (with a faction of reaction of $\beta_{2,1}$) and a discretionnary spending shock. The last equation represents the mechanism of automatic stabilizers, activity innovations are quarterly dependant of fiscal innovations (with a tax elasticity of $\alpha_{3,1}$ and a public spending elasticity of $\alpha_{3,2}$) and otherwise due to exogenous (demand) shock.

The identification of this model is achieved by providing estimates of both contemporaneous elasticities and reaction factors.

### 2.2 Structural identification of quarterly output elasticities

There are many reasons for analysing simultaneously the effects of taxes and spendings. Nevertheless, those agregates are composed by very different items. For instance Blanchard and Perotti (2002) take the total direct and indirect taxes plus all transfers received by government minus all transfers paid by government as a proxy for the tax pressure (that actually become a net-of-transfers tax pressure). As far as public spending is concerned they add public consumption and investment and net interest disboursments.

Such agregation matters as it constraints every fiscal component to have the same sensitivity to activity. In fact the authors estimate the output elasticities for each desagregate component and then compute the $\alpha_{1,3}$, and $\alpha_{2,3}$ parameters as a weighed average of this elasticities. As we want to focus on automatic stabilizers we pay a great attention to biases potentially created by the agregation.

#### 2.2.1 Data set

We collect the data from the OECD *Economic Outlook* dataset. The quarterly series of eight European countries (Finland, France, United Kingdom, Ireland, Italy, Netherlands, Sweden and Germany -West Germany before1990) from 1975:1 to 2004:4 are divided in fiscal variables and other macroeconomic variables (needed to compute output elasticities). Fiscal variables are (using OECD names):

- Government Consumption, $GCONS$
- Government Investment, $GINV$

---

1 The data begins in 1978 for Italy and Netherlands
Subsidies, $SUB$

Social Benefits paid by Government, $BEN$

Other Current Transfers paid by Government, $TRANS$

Direct Taxes Households, $HDT$

Direct Taxes Business, $BDT$

Social Security Contribution received by Government, $CONT$

Other Current Transfers received by Government, $REL$

Indirect Taxes, $IDT$

Some of them are put together, according their macroeconomic bases.

Spending transfers, $S = TRANS + BEN + SUB$

Social Contributions, $SOC = CONT + REL$

Macroeconomic variables are used to estimate the output elasticities of fiscal variables. They involve:

Gross Domestic Product, $GDP$

Private Consumption, $PCONS$

Employment, $EMP$

Real Wages and Salaries, $WAG$

Except for EMP and UNP, variables are expressed in real term per capita.

2.2.2 Output elasticity of fiscal variables

Recent contributions to the empirics of fiscal cyclical components show the importance of composition effects (van den Noord, 2002, Bouthevillain et al., 2001). As a consequence the output elasticity of fiscal revenues and expenditures must be estimate with desagragated components, and the fiscal base must be well specified. We adopt the Blanchard-Perotti (2002) specification for the estimation of cyclical elasticities at quarterly frequence.
Output elasticity of household direct taxes and social contributions. Direct taxes and social contributions are supposed to be dependant on the rate of wage $w$ times the number of employed persons $e$. If the amount of fiscal revenues is called $x$, it can be written as:

$$x_t = x(w) \times w(e) \times e(y)$$

Which in difference leads to:

$$dx_t = \frac{\partial x}{\partial w} dw + \frac{\partial w}{\partial e} de + \frac{\partial e}{\partial y} dy$$

and finally:

$$dx_t = \left[ \left( \frac{\partial x}{\partial w} + 1 \right) \frac{\partial w}{\partial e} + 1 \right] \frac{\partial e}{\partial y} dy$$

The term in parenthesis $\left( \frac{\partial x}{\partial w} + 1 \right)$ represents the mean tax rate with respect to wages. It depends on national tax codes and on the income distribution. We collect these information from van den Noord (2002). Remaining terms, employment elasticity of wage $\frac{\partial w}{\partial e}$ and the output elasticity of employment $\frac{\partial e}{\partial y}$, can be estimated with the macroeconomic data we have collected.

We adopt the same specification as Blanchard and Perotti. Employment elasticity of wage is obtained as the $\gamma_{1,0}$ coefficient in the following regression:

$$\Delta \log WAG_t = \sum_{i=1}^{4} \gamma_{1,i} \Delta \log EMP_{t-i}$$

Output elasticity of employment corresponds to the $\gamma_{2,0}$ coefficient in:

$$\Delta \log EMP_t = \sum_{i=1}^{4} \gamma_{2,i} \Delta \log GDP_{t-i}$$

Output elasticity of business direct taxes. Business direct taxes are based on firm profits. We suppose the profit to be proportional to the firm income. Let $b$ represents this base, we have:

$$b_t = \bar{b} [y_t - w(e) \times e(y)]$$

The output elasticity of business direct taxes is then obtained form the following formula:

$$db_t = \bar{b} \left[ 1 - \frac{\partial e}{\partial y} \left( \frac{\partial w}{\partial e} + 1 \right) \right] dy_t$$

where $\bar{b}$ is the profit share in GDP, taken from van den Noord (2002). We use the same estimates as above for $\frac{\partial e}{\partial y}$ and $\frac{\partial w}{\partial e}$. 

6
Output elasticity of transfers. Transfers expenditures $s$, are linked to the cyclical activity in reaction to change in employment. We directly estimate this elasticity as:

$$ ds = -\frac{\partial e}{\partial y} \, dy $$

The regression is:

$$ \Delta \log UNP_t = \sum_{i=-1}^{4} \gamma_{3,i} \Delta \log GDP_{t-i} $$

and $\frac{\partial u}{\partial y}$ is captured by $\gamma_{3,0}$

Output elasticity of direct taxes. Direct taxes like VAT are based on private consumption $c$. As the tax rate does not change during the cycle, the output elasticity of direct taxes is computed as the output elasticity of private consumption.

$$ dc = -\frac{\partial c}{\partial y} \, dy $$

$\frac{\partial c}{\partial y}$ is given by $\gamma_{4,0}$ in:

$$ \Delta \log PCONS_t = \sum_{i=-1}^{4} \gamma_{4,i} \Delta \log GDP_{t-i} $$

2.2.3 Results of estimates

Output elasticities of fiscal variables are computed by using previous formulas and estimates of $\gamma_{1,0}$, $\gamma_{2,0}$, $\gamma_{3,0}$, $\gamma_{4,0}$ coefficients we have reported in appendix. Table 1 exposes computation results for two aggregated tax rates. The fist one, in line with Blanchard and Perotto, is a net-of-transfers tax rate ($Tn$) with:

$$ Tn = HDT + BDT + IDT + SOC - S $$

The output elasticity of $Tn$ is computed as a weighted average of output elasticity of each of its component. We also define ay aggregate tax rate ($T$) without substracting transfers spending $S$.

$$ T = HDT + BDT + IDT + SOC $$

There are at least two reasons for such a distinction. First, the output of elasticity transfers spending is related to the elasticity of employment whereas the elasticity of social contribution is depending on reactions of wage to employment and social tax rate to wage. Fiscal bases are totally different. Moreover the timing of tax collection might be longer than the one of transfers disboursments. Second the amount of transfers is quite important (rather the half of total public spending).
Table 1. Output elasticity of fiscal components

<table>
<thead>
<tr>
<th>output elasticity of</th>
<th>household direct taxes</th>
<th>business direct taxes</th>
<th>indirect taxes</th>
<th>social contributions</th>
<th>transfers spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>0.08</td>
<td>0.32</td>
<td>0.37</td>
<td>0.08</td>
<td>-0.07</td>
</tr>
<tr>
<td>France</td>
<td>0.35</td>
<td>0.25</td>
<td>0.87</td>
<td>0.30</td>
<td>-0.22</td>
</tr>
<tr>
<td>U.-K.</td>
<td>0.11</td>
<td>0.28</td>
<td>0.87</td>
<td>0.10</td>
<td>-0.08</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.53</td>
<td>0.25</td>
<td>0.14</td>
<td>0.43</td>
<td>-0.23</td>
</tr>
<tr>
<td>Italy</td>
<td>0.22</td>
<td>0.37</td>
<td>0.38</td>
<td>0.20</td>
<td>-0.17</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.55</td>
<td>-0.02</td>
<td>0.30</td>
<td>0.96</td>
<td>-0.12</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.25</td>
<td>0.23</td>
<td>0.47</td>
<td>0.22</td>
<td>-0.15</td>
</tr>
<tr>
<td>Germany</td>
<td>0.94</td>
<td>0.08</td>
<td>1.14</td>
<td>0.71</td>
<td>-0.46 (NS)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>share in</th>
<th>Tn</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>0.67</td>
<td>0.31</td>
</tr>
<tr>
<td>France</td>
<td>0.27</td>
<td>0.12</td>
</tr>
<tr>
<td>U.-K.</td>
<td>0.61</td>
<td>0.33</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.60</td>
<td>0.30</td>
</tr>
<tr>
<td>Italy</td>
<td>0.57</td>
<td>0.30</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.45</td>
<td>0.24</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.67</td>
<td>0.34</td>
</tr>
<tr>
<td>Germany</td>
<td>0.48</td>
<td>0.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>weighted output elasticity</th>
<th>Tn</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>0.47</td>
<td>0.18</td>
</tr>
<tr>
<td>France</td>
<td>1.22</td>
<td>0.49</td>
</tr>
<tr>
<td>U.-K.</td>
<td>0.78</td>
<td>0.37</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.89</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Table 1 shows a great difference between the output elasticity of $Tn$ and the one of $T$. One might consider that considering transfers spending and tax collection together leads to a positive bias in the output elasticity of tax aggregate (the current reaction of taxes to business cycle is not as fast as the one of transfers disboursement).

Thereafter, we specify two S-VARs specification (called model 1 and model 2) in order to take into account this composition effect. In model 1, the endogeneous vector is $X_{1,t}$:

$$X_{1,t} = ( Tn_t, G_t, Y_t )$$

Coefficient $\alpha_{1,3}$ is given by results of table 1, and we suppose $\alpha_{2,3} = 0$. There is actually no reason for primary public spending ($G_t = GCONS + GINV$) to react to output innovations within a quarter.
In model 2, the endogeneous vector $X_{2,t}$ is given by:

$$X_{2,t} = ( T_t \quad S_t \quad Y_t )$$

Elasticity coefficients $\alpha_{1,3}$ and $\alpha_{2,3}$ are taken from table 1 for the identification of (1).

Model 1 allows for estimating the impact of primary spending of government, *ceteris paribus*, while model 2 can capture the mechanism of automatic stabilisers with a special focus on the respective impact of tax receipts and transfers disboursments.

### 2.3 Estimates of contemporaneous reaction factor

The remaining parameters we have to identify in the Blanchard-Perotti model (1) are providing by a series of Instrumental Variable Estimates. From the canonic residuals we first define cyclically adjusted fiscal innovations:

$$t^{CA}_t = t_t - \alpha_{13}y_t$$
$$g^{CA}_t = g_t - \alpha_{23}y_t$$

Then is we suppose $\beta_{12} = 0$, we can estimate $\beta_{21}$ by OLS in a regression of $g^{CA}_t$ on $t^{CA}_t$. In this fiscal policy regime shocks on taxes are supposed to be exogenous while public spending reacts systematically to tax shocks. In other words the government is supposed to "tax and spend". Tax pressure structural shocks are identified as $\tilde{\varepsilon}^T_t = t^{CA}_t$. Structural public spending shocks $\tilde{\varepsilon}^G_t$ are given by the estimated residuals of the OLS regression.

The alternative regime "spend and tax" can also be considered. In this case, public spending shocks are supposed to be exogeneous and $\beta_{21} = 0$, and $\tilde{\varepsilon}^G_t = g^{CA}_t$. The reaction factor $\beta_{12}$ is estimated by OLS by regressing $t^{CA}_t$ on $g^{CA}_t$ and structural shocks $\tilde{\varepsilon}^T_t$ are provided by estimated residuals.

Whatever the policy regime is, last parameters $\alpha_{31}$ and $\alpha_{32}$ are estimated by Instrumental Variables in a regression of $y_t$ on $t_t$ and $g_t$ using respectively $\tilde{\varepsilon}^T_t$ and $\tilde{\varepsilon}^G_t$ as instruments in order avoid auto-correlation in regressors.

As in Blanchard-Perotti (2002) the hypothese on the policy regime does not matter for the results. We then present estimates in the case of a "tax and spend" regime. Table 2 presents estimation results. We first observe that more coefficients are significantly different from zero in model 2. The impact of tax innovation on output is negative whereas the impact of transfers is positive, and the size effects are rather close. It suggests that possible differences in the automatic stabilizer effect must mainly come from differences in output elasticity of tax and transfers, but do not come from different output reaction to taxes and transfers. As a consequence, in the model 1, the output reaction to innovation of net-of-transfers taxes is not different from zero in most countries. Primary public spending shock has generally no impact on output within the quarter. It seems to confort the quality of shock identification as "discretionary" policy shocks.
Table 2. Contemporaneous Reaction Factor Estimates

<table>
<thead>
<tr>
<th>Countries</th>
<th>Model 1. $X_{1,t} = (Tn_t \ G_t \ Y_t)$</th>
<th>Parameters</th>
<th>Model 2. $X_{2,t} = (T_t \ S_t \ Y_t)$</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_{21}$</td>
<td>$\alpha_{31}$</td>
<td>$\alpha_{32}$</td>
<td>$\beta_{21}$</td>
</tr>
<tr>
<td>Finland</td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.08)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>France</td>
<td>-0.05</td>
<td>-0.19</td>
<td>0.05</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.05)</td>
<td>(0.10)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>U.-K.</td>
<td>0.00</td>
<td>0.02</td>
<td>0.05</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.06)</td>
<td>(0.39)</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.09</td>
<td>-0.70</td>
<td>0.06</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.13)</td>
<td>(0.11)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.02</td>
<td>-0.09</td>
<td>0.13</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.04)</td>
<td>(0.20)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-0.13</td>
<td>-2.73</td>
<td>-0.34</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.91)</td>
<td>(0.36)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.03</td>
<td>-0.16</td>
<td>0.17</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.07)</td>
<td>(0.11)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.72</td>
<td>-2.90</td>
<td>3.13</td>
<td>1.73</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(2.01)</td>
<td>(1.63)</td>
<td>(0.36)</td>
</tr>
</tbody>
</table>

* Instrumental Variable Estimates

Standard errors in brackets

3 Analyses of model simulation

In this section we present the results of the S-VARs simulation. We first pay attention to the dynamic fiscal multipliers and then focus on the degree of automatic stabilisation provided by taxes and transfers system. Graphs of the accumulated impulse response function are reported in the appendix B.

3.1 Fiscal policy multipliers

Public spending multipliers. We simulate the impulse response of output after a shock on primary public spending (graph B 1). The effect is totally neutral even on the first step of the simulation. There are two exceptions. France where the multiplier reach 0.3 after three quarters and Germany with a very large effect of 2.0 during two quarters. In Ireland and Netherlands public spending shocks have a negative impact on GDP, that reach -1 on the long run.

As a complement we also simulate the impact of shocks in public transfers. Results are reported in graph B 4. We obtain a positive impact of shocks in transfers ou
output. The fiscal multiplier is close to 1 or higher in Germany, Italy, Netherlands and Ireland. There are no significant effects in France and in the United Kingdom and a persistant negative effect in Sweden.

Dynamic effects of public spending components are different from one country to one other. The analysis confirm a rather neutral effect of shocks on primary spending, which turn to be destabilising in small countries. On the contrary, biggest countries still benefit of Keynesian effects, even if multipliers are lower than announced in the theory. As transfers spending directly affect private income and consumption, the dynamic effect of shocks on public transfers remain positive and higher in most of country as predicted by standard Keynesian theory.

**Tax pressure multipliers.** Impulse responses of real output to shocks on net-of-transfers taxes ($Tn$) are shown of graph B 3. The tax multiplier has a negative sign in France, in Ireland and in Netherland. Surprisingly, the multiplier is positive in Finland, in Sweden and in Germany. We simulate impulse responses of shock on taxes ($T$) in order to capture only the impact of direct, indirect and social taxes. Results printed on graph B 2. show a negative impact of tax burden in Ireland, Italy and Netherland. The introduction of transfers in $Tn$ must have diminish the size of the tax multipliers. Nevertheless we still obtain a positive impact in Germany.

As far as taxes and public spending are concerned, our results underlines a small effect of discretionary shocks in most countries. They are generally no significant even on the short run. Primary spending shocks are destabilising in small countries. Shocks on transfers look more effective to manage macroeconomic activity.

### 3.2 Automatic stabilizers effects

If automatic stabilizers work efficiently, variations of disposable income $DY$ must be smallest the variations in activity, this implies:

$$DY = \alpha Y$$

with

$$|\alpha| < 1$$

Automatic stabilisers are effective if $\alpha$ is far from one -in absolute value.

We compute estimation of $\alpha$ from the simulation of a exogeneous shocks on real output $\varepsilon^Y$. In the first case we define disposable income as the net-of-tax income:

$$DY = Y - Tn$$

Reaction of $DY$ after a shock on $\varepsilon^Y$ is given by:

$$dDY = \sum \frac{\partial Y}{\partial \varepsilon^Y} dY - \sum \frac{\partial Tn}{\partial \varepsilon^Y} dY$$
The measure of the degree of stabilisation (\(\alpha\)) is considered as "global". We also try to see is composition between tax pressure and transfers disbursed matters by defining \(DY\) as:

\[
DY = Y - T + S
\]

and we compute:

\[
\alpha' = 1 - \frac{\sum \frac{\partial T}{\partial x} - \sum \frac{\partial S}{\partial x}}{\sum \frac{\partial Y}{\partial x}}
\]

One might consider the difference of between this estimates must come from the fact that shocks on \(Tn, T\) and \(S\) are not identified by the same numerical constraint, but with their own quarterly output elasticity.

"Global" macroeconomic stabilisation. Graph 1 shows the result for \(\alpha\). Automatic stabilizers do not operate except in the United Kingdom and in Ireland. Nevertheless, taxes and transfers seem to reduce about 50% of output variations.

Graph 1. "Global" Automatic Stabilizers

Does composition matter? When take into account the special role of taxes and transfers, automatic stabilizers look more effective as testify Graph 2 where \(\alpha'\) are reported. Automatic stabilizers reduce about 80% of output volatility in Finland,
Those two graphs reveal the importance of the combination of tax system and public transfers. We try to understand why in studying the correlation of quarterly output elasticity of $Tn$, $T$ and $S$ (i.e. coefficient $\alpha_{1,3}$ of model 1 and coefficients $\alpha_{1,3}$ and $\alpha_{2,3}$ in model 2) and the evolution of stabilisation degree $\alpha$ and $\alpha'$. Results presented in appendix C leads to interesting characteristics. There is a negative relation between output elasticity of net-of transfers taxes and the degree of macro stabilisation. The higher reaction of net tax revenues to output fluctuation the lesser stability of disposable income in response to output shock. In fact the problem do not come for the output elasticity of direct, indirect and social taxes but from the output elasticity of transfers. When transfers are highly reactive to the cycle, they lead to a rise of disposable income that do more than compensating the negative shock of output. Public transfers adds a source of macroeconomic instability.

Such results could lead to important policy prescription. If European countries must develop the role of automatic stabilizers, they would have to imagine a reform of tax codes and transfers system that would decrease the cycle sensibility of transfers (one could imagine that lump sum transfers would act better than proportional ones).

4 Conclusion

We analyse the dynamic effects of fiscal policy in European countries using a SVAR model. The Blanchard and Perotti method of identification is extended to take into account a proper role of automatic stabilizers.
The result confirm the low effect of discretionnary fiscal shocks, in particular, in small European countries. Automatic Stabilizers perform better but face some composition issue. We put in advance some destabilising effects of transfers systems which are supposed to react proportionaly to activity fluctuations and that can enhance the output instability.

References


[8] Lucas (2003), Macroeconomic Priority, mimeo, University of Chicago


### A DESAGREGATED ELASTICITY ESTIMATES

#### TABLE A 1. ELASTICITY ESTIMATES

<table>
<thead>
<tr>
<th></th>
<th>output elasticity of employment</th>
<th>employment elasticity of wages</th>
<th>output elasticity of consumption</th>
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<tr>
<td></td>
<td>coef</td>
<td>t-stat</td>
<td>$R^2$</td>
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<thead>
<tr>
<th></th>
<th>wage elasticity of</th>
<th>profit share in GDP*</th>
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* Data extracted from van den Noord (2002)
B IMPULSE RESPONSE FUNCTIONS

GRAPH B 1. ACCUMULATED RESPONSE OF YRP TO SHOCKS ON G

GRAPH B 2. ACCUMULATED RESPONSE OF YRP TO SHOCKS ON T
GRAPH B 3. ACCUMULATED RESPONSE OF YRP TO SHOCKS ON $Tn$

GRAPH B 4. ACCUMULATED RESPONSE OF YRP TO SHOCKS ON $S$
C AUTOMATIC STABILIZERS AND FISCAL STRUCTURE

GRAPH C1. SCATTER PLOT:
Output elasticity of $Tn$ vs. Macrostabilisation degree $\alpha$

Graph C 2. SCATTER PLOT
Ouptut Elasticity of $S$ vs Macrostabilisation Degree $\alpha'$
Graph C 3. SCATTER PLOT

Output Elasticity of $T$ vs Macrostabilisation Degree $\alpha'$